
March 28, 2003



Infrastructure and Environment

Army Response to Chemical Agent
Incident at Tooele Chemical Agent
Disposal Facility
(D-2003-068)

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Acronyms

ASA(I&E)	Assistant Secretary of the Army (Installations and Environment)
GAO	General Accounting Office
IG DoD	Inspector General of the Department of Defense
PMCD	Program Manager for Chemical Demilitarization
TOCDF	Tooele Chemical Agent Disposal Facility



INSPECTOR GENERAL
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March 28, 2003

MEMORANDUM FOR ASSISTANT TO THE SECRETARY OF DEFENSE
(NUCLEAR AND CHEMICAL AND BIOLOGICAL
DEFENSE PROGRAMS)
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Report on Army Response to Chemical Agent Incident at Tooele Chemical
Agent Disposal Facility (Report No. D-2003-068)

We are providing this report for information and use. We performed the evaluation in response to a request from the Assistant to the Secretary of Defense (Nuclear and Chemical and Biological Defense Programs). We considered management comments on a draft of this report in preparing the final report. Comments on the draft conformed to the requirements of DoD Directive 7650.3 and left no unresolved issues. Therefore, no additional comments are required.

We appreciate the courtesies extended to the staff. Questions should be directed to Mr. George P. Marquardt at (703) 604-9275 (DSN 664-9275) or Mr. William C. Gallagher at (703) 604-9270 (DSN 664-9270). See Appendix D for the report distribution. The team members are listed inside the back cover of the report.

David K. Steensma
Deputy Assistant Inspector General
for Audit

Office of the Inspector General of the Department of Defense

Report No. D-2003-068

March 28, 2003

Project No. (D2002CB-0200)

Army Response to Chemical Agent Incident at Tooele Chemical Agent Disposal Facility

Executive Summary

Who Should Read This Report and Why? Senior managers and officials responsible for the chemical agent destruction program should read this report. The report discusses requirements for the successful investigation of a chemical agent accident.

Background. Congress required DoD to destroy about 31,500 tons of highly toxic chemical agents by April 2007, the deadline set by an international treaty for the elimination of all chemical weapon stockpiles. The Office of the Secretary of Defense and the Army shared program responsibility. During July 2002, of the eight programmed chemical agent disposal program facilities, Tooele Chemical Agent Disposal Facility was the only site operating. On July 15, 2002, at 8:20 a.m., two contractor maintenance workers entered the liquid incinerator primary room to perform non-routine maintenance. The portable GB agent monitor alarmed, and during a change of equipment the worker transferred contamination from his leather glove to his head, hair, and respirator. The exposed worker experienced miosis (reduction of eye pupil), red blood cell cholinesterase depression, disorientation, headaches, blurry vision, tightness in the chest, and a runny nose, all symptoms indicative of exposure to GB agent. This chemical event was the first reported significant exposure to a worker during the life of the program. The Army response to the chemical agent accident included separate investigations by the systems contractor and the Army.

Results. Although the contractor's investigation report of the chemical agent accident that occurred at Tooele Chemical Agent Disposal Facility on July 15, 2002, was insufficient, the subsequent Army report was comprehensive. The Army treated the worker exposure as a serious accident, conducted an investigation led by senior Army management, and used the investigation findings to generate program improvement. On July 16, 2002, the Assistant Secretary of the Army (Installations and Environment) appointed a Board of Investigation, and on September 23, 2002, signed the completed report.

The Army Board of Investigation identified 50 findings, including 12 direct causes, 20 indirect causes, and 18 observations, and developed 97 recommendations for corrective actions directed at the systems contractor and multiple organizations within the Army. Army officials stated that the facility would not resume operation until corrective actions related to direct causes were implemented. We reached the following conclusions during our review.

- The Board President assembled a fully qualified team, conducted a complete investigation of the incident, and produced a comprehensive report. Provided the Army accurately tracks and verifies the correction of identified deficiencies, the investigation will have met the intent and purpose of preventing accident recurrence.
- DoD policy and Army regulations did not provide specific guidance governing investigation of this type of event. Even though the exposed worker demonstrated multiple symptoms of chemical nerve agent exposure, based on severity classification, the incident was not considered significant for reporting and investigation within DoD policy and Army regulations. However, the Assistant Secretary of the Army (Installations and Environment) recognized the significance of the incident, and the Board President investigated the event using procedures reserved for serious accidents.
- The systems contractor had an informal process for reporting safety concerns, preventing the contractor and the Army from verifying or disproving widely-held employee negative opinions. While systems contractor management self-identified problems with communicating safety issues, results of an employee opinion survey of 212 employees provided contradictory views of the communication between employees and managers.
 - More than 85 percent of the employees were aware of the safety reporting process and believed management encouraged safety reporting.
 - More than 50 percent of the employees surveyed indicated that management stressed production over safety during operations.
 - Sixteen percent of the survey respondents stated they had been told to fix a problem and not report it.
- The Army investigation and corrective action process compared favorably with similar processes used by other Services and other Federal agencies. All processes we reviewed contained similar elements, metrics, and standards.

On January 13, 2003, the Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health led a multidisciplinary team to the Tooele Chemical Agent Disposal Facility to verify corrective action completion.

Management Comments. Although no comments were required, the Assistant to the Secretary of Defense (Nuclear and Chemical and Biological Defense Programs) stated that there were eight programmed chemical agent destruction sites, and that the lack of a program manager for the chemical demilitarization program has not been determined to be a reflection on the Army investigation.

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Background

On July 19, 2002, the Assistant to the Secretary of Defense (Nuclear and Chemical and Biological Defense Programs) requested that the Inspector General of the Department of Defense perform an independent review of the Army investigation of a chemical agent event that occurred on July 15, 2002, at the Tooele Chemical Agent Disposal Facility (TOCDF), Utah.

DoD Chemical Demilitarization Program. In 1985, Congress required DoD to establish an organization within the Army to manage the chemical agent destruction program. The Office of the Secretary of Defense and the Army shared management roles and program responsibility. The Army Program Manager for Chemical Demilitarization (PMCD) was responsible for program execution under the direction of the Assistant Secretary of the Army (Installations and Environment) (ASA[I&E]). The Army planned to destroy about 31,500 tons of highly toxic chemical agents by April 2007, the deadline set by an international treaty for the elimination of all chemical weapon stockpiles. As of March 2002, the Army had destroyed over one-quarter (8,044 tons) of the U.S. stockpile. During July 2002, of the eight programmed chemical agent disposal program facilities, TOCDF was the only site operating. TOCDF was a tenant facility located on the Deseret Chemical Depot. EG&G Defense Materials Inc. (EG&G), the on-site systems contractor, completed destruction of GB¹ agent in March 2002, and in July 2002 was performing maintenance leading to the initiation of VX² agent destruction. The chemical event of July 15, 2002, was the first reported significant exposure to a worker during the life of the program.

Chemical Event at TOCDF. On July 15, 2002, at 8:20 a.m., two contractor maintenance workers entered the liquid incinerator primary room wearing minimum-level personal protective equipment (a full face industrial respirator, overalls, and leather boots and gloves) to perform non-routine maintenance requiring the exchange of an air pressure regulator. Immediately following the removal of the section of pipe containing the existing air pressure regulator, the portable GB agent monitor alarmed and both workers exited to the secondary room. The workers removed their industrial respirators and put on the Government-issued respirators. During the change of masks, the worker that had handled the pipe transferred contamination from his leather glove to his head, hair, and Government respirator. The two workers subsequently spent almost 4 hours undergoing repeated decontamination cycles before medical personnel declared them free of contamination. The exposed worker demonstrated miosis (reduction of eye pupil) and red blood cell cholinesterase depression, indicative of exposure to GB agent. He later stated that he also experienced disorientation, headaches, blurry vision, tightness in the chest, and a runny nose.

¹ GB agent, also known as sarin, is a nerve agent that was developed in the 1930s and 1940s and primarily attacks through the respiratory system. GB agent can also be absorbed through the skin and eyes.

² VX agent, a nerve agent developed in the early 1950s, acts by absorption through the skin. VX agent injures and kills an enzyme of the human body essential for the functioning of the nervous system.

Guidance on Chemical Events. Applicable DoD and Army policy and guidance address the chemical agent program and the reporting, investigating, and recording of mishaps and accidents.

DoD Instruction 6055.7, “Accident Investigation, Reporting, and Record Keeping,” October 3, 2000, defines a chemical agent accident as any unintentional or uncontrolled release of a chemical agent when, among other things, individuals exhibit physiological symptoms of agent exposure. The Instruction states DoD policy to establish and implement comprehensive programs to investigate, report, and keep related records on accidental death, injury, occupational illness, and property damage for DoD accidents. The Instruction also establishes accident severity classes for reporting and investigation according to the resulting injury, occupational illness, or property damage, and requires DoD Component heads to develop procedures ensuring the investigation and reporting of accidents resulting in injuries or reportable damage. For accidents involving contractor personnel, the Instruction requires DoD Component heads to direct contracting Components to conduct an investigation and prepare a report.

Army Regulation 385-61, “The Army Chemical Agent Safety Program,” October 12, 2001, states that chemical events encompass all chemical accidents, incidents, and politically and public sensitive occurrences. Specifically, a chemical event applies to, among others, confirmed release of an agent from munitions, or actual exposure of personnel to an agent above the allowable limits. The regulation also states that chemical agent events will be reported according to Army Regulation 50-6 and investigated by means of Army Regulation 385-40.

Army Regulation 50-6, “Chemical Surety,” June 26, 2001, states that chemical events will be reported directly to the Deputy Chief of Staff for Operations and Plans, Army Operations Center. The regulation allows the Army major command incurring the accident to determine the degree and level of investigation, but requires the investigation board to include members experienced in investigation procedures and the effects of chemical agents.

Army Regulation 385-40, “Accident Reporting and Records,” November 1, 1994, implements DoD Instruction 6055.7, provides policies and procedures, and assigns responsibilities for the initial notification, investigating, and reporting of Army accidents. Army Regulation 385-40 states that all Army chemical events will be investigated for the purpose of accident prevention. It also states that depending on the situation, any type of chemical event may warrant a Headquarters, Department of the Army investigation. The regulation defines accident classes based on severity, provides specific guidance on appropriate investigative and reporting procedures for serious accidents, and provides general guidance for other events. The Army implements the regulation using Pamphlet 385-40, “Army Accident Investigation and Reporting,” November 1, 1994.

Objectives

Our objective was to provide an oversight evaluation of the Army's response to a nerve agent exposure that occurred at the TOCDF on July 15, 2002. Specifically, we determined if the Army's investigation of this chemical event met Army requirements. In addition, we assessed the safety reporting process at TOCDF. We also compared DoD and Army investigation procedures and corrective action development following chemical agent incidents with other Federal agency processes. See Appendix A for a discussion of the scope and methodology of the review, and prior coverage related to the review objectives.

Army Chemical Event Response

Although the contractor's investigation report of the chemical agent accident that occurred at TOCDF on July 15, 2002, was insufficient, the subsequent Army report was comprehensive. The combined investigations were adequate and met DoD and Army requirements. We reached the following conclusions during our review.

- The Army assembled a fully qualified team, conducted a complete investigation of the incident, and produced a comprehensive report.
- While DoD policy and Army regulations did not provide specific guidance governing investigation of this event, the Army response satisfied the intent and purpose of accident investigation.
- The systems contractor had an informal process for reporting safety concerns, systems contractor management identified problems with communicating safety issues, and employees indicated that management stressed production over safety during operations.
- The Army investigation and corrective action process compares favorably with similar processes in other Federal agencies.

The Army planned to implement recommendations made by the Board of Investigation, and stated that production at TOCDF would not resume until corrective actions to prevent recurrence were completed and verified.

Army Response

Contractor Investigation. The operating contract between the Army and EG&G required the contractor to complete and submit accident reports in accordance with Army Regulation 385-40. EG&G met contractual requirements by conducting a corporate investigation of the incident, preparing investigation documents, providing assistance to the Army Board of Investigation, and delivering the investigation report to PMCD on August 1, 2002. The EG&G investigation team performed a Kepner-Tregoe analysis, defining a direct cause as the proximate cause of the event and a root cause as the cause that must be removed to fix the problem permanently. The EG&G investigation team concluded that the direct causes of the event were chemical agent migration beyond the agent expected boundary, and the failure of personnel to wear appropriate personal protective equipment. However, the report stated the root cause of the accident as inadequate policy governing the choice of personal protective equipment. The EG&G investigators failed to address the agent migration in their root cause discussion. Army officials believed that the report was insufficient.

Army Investigation. On July 16, 2002, the ASA(I&E), under the authority of General Order No. 3 and in accordance with Army Regulation 385-40, assumed responsibility as the appointing authority for the investigation of the chemical agent event. He directed the Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health to assemble a Board of Investigation (the Board) to investigate the chemical event in accordance with Army Regulation 385-40. The Deputy Assistant Secretary, as the President of the Board of Investigation (Board President), named initial board members on the same day. The Board assembled at TOCDF and conducted data collection on site from July 17 through July 26, 2002. The ASA(I&E) signed the completed report of investigation on September 23, 2002.

Oversight Assessment of the Army Response

While DoD policy and Army regulations did not provide specific guidance governing investigation of this event, the Army response satisfied the primary purpose of accident investigation. Even though a worker demonstrated multiple symptoms of nerve agent exposure, the incident was not considered significant for reporting and accident classification within DoD policy and Army regulations. However, the ASA(I&E) recognized the significance of the incident and the Board President investigated the event using procedures reserved for serious accidents.

DoD and Army Chemical Event Classification. DoD and Army classification of chemical events differs for reporting and investigation. For reporting, DoD policy defines the worker exposure of July 15, 2002, as a chemical agent accident. However, since the chemical agent accident did not involve DoD personnel and caused no reportable damage, it was not clear whether the accident was reportable. According to Army Regulation 385-61, the worker exposure of July 15, 2002, was a chemical event subject to Army Regulation 50-6 for reporting. According to Army Regulation 50-6, the worker exposure was specifically a Category II chemical event, and also a chemical accident. On July 15, 2002, the Commander of Deseret Chemical Depot accurately reported the worker exposure as a Category II chemical event.

For investigation, the accident did not meet severity classification criteria for either DoD policy or Army regulations. The Board President classified the accident as an “event,” since the exposed individual did not lose time from work beyond the shift during which the accident occurred and there was insignificant property damage. Neither Army Regulation 385-40 nor Army Pamphlet 385-40 provides specific guidance on how to investigate and report on accidents classified as “events,” or handle contractor accidents. In addition, Army Regulation 385-40 only applies to “Army accidents,” and it was unclear if the event met the definition. However, the ASA(I&E) considered the worker exposure a significant event and exercised his authority to conduct a Headquarters, Department of the Army investigation.

Army Investigation Process. According to Army Regulation 385-40, the primary purpose of investigating and recording accidents is prevention. The Army investigation process for serious accidents required the Board President to assemble a qualified board, conduct the investigation to identify cause factors and deficiencies, and produce a report summarizing findings and recommendations.

Investigation Board. On July 16, 2002, with the approval of the ASA(I&E), the Board President named eight individuals to the board based on personal knowledge of their expertise and experience. Board participants were initially designated as a member, adviser, or observer. The Board President reclassified observers as advisers due to their high level of participation during the data collection and deliberation process. Through the addition of five technical experts during the investigation process, the final composition of the board was six voting members and eight non-voting advisers.

To ensure an unbiased investigation, the ASA(I&E) named board members from organizations other than the activity incurring the accident and had no personal interest in the outcome. The Board President was outside the PMCD line of authority. The remaining five members were from:

- the Centers for Disease Control and Prevention, U.S. Department of Health and Human Services (two members);
- the Office of the Director of Army Safety;
- the U.S. Army Center for Health Promotion and Preventive Medicine; and
- the U.S. Army Soldier Biological and Chemical Command.

The eight board advisers consisted of three Government employees, four Government contract employees, and one Oregon state employee. The Board President chose two of the Government employee advisers from Headquarters, PMCD. Also, two of the four Government contract employees chosen worked under contract to PMCD. However, all eight advisers selected by the Board President met the requirements of Army Regulation 385-40, and there was no evidence of bias or negative impact on the investigation.

Investigation Process. Army Commanders are required to investigate and analyze accidents to the extent needed to identify cause factors and deficiencies, and develop countermeasures to prevent similar accidents. Army Pamphlet 385-40 outlines the required investigation phases: planning, data collection, and data analysis. Since this accident was an “event” under classification severity criteria, the Board was not required to follow the specific format of Army Pamphlet 385-40. The Board Recorder used Corps of Engineers Pamphlet 385-1-40, “Safety and Occupational Health Boards of Investigation,” May 31, 1991, as a guide.

The Board planned and conducted the investigation simultaneously. The Board President named an ad hoc group of experienced technical experts to conduct the investigation the day following the event. The Board Recorder

performed initial planning and the Board assembled and held their initial meeting on site. In this case, the lack of prior planning did not seem to distract from the quality of the investigation.

The data collection conducted by the Board was sufficient to develop accident causation. Since the Board Recorder used Corps of Engineers Pamphlet 385-1-40 as a guide, accident data were not organized into the categories listed in Army Pamphlet 385-40. However, EG&G employees, managers at TOCDF, and other government officials involved with the investigation stated that the Board obtained the appropriate evidence. In addition, the Board took full advantage of data resulting from the EG&G investigation, while remaining independent of the contractor's conclusions. Finally, interviewees believed that the Board members conducted thorough, competent interviews.

Board members analyzed the data to establish a chronology, identify errors and system inadequacies, and develop recommendations for corrective actions. The Board developed a detailed chronology of the accident, starting with the shift change meeting prior to the accident and ending with the release of the exposed worker from the clinic almost 9 hours later. They achieved consensus on accident causation and identified 50 findings, including 12 direct causes, 20 indirect causes, and 18 observations, from which they developed 3 root causes. The Board also developed 97 recommendations directed at the systems contractor and multiple organizations within the Army for corrective action. We concluded that the recommendations flowed from the facts and analysis presented.

Investigation Recording. The Army Board summarized the results of their investigation in a general use safety accident investigation report that was timely and comprehensive. The ASA(I&E) signed the completed report 70 days after appointing the Board President. The findings and recommendations covered actions before, during, and after the accident, including aspects of planning, oversight, management, safety, and medical response operations. While the report contained all the elements of an investigation narrative according to Army Pamphlet 385-40, we believe there were two significant omissions: there was no stated completion date for a corrective action plan, and root causes did not address engineering failures.

The Board report did not provide required completion dates for any corrective actions. However, the report stated that plant operations should not resume until TOCDF operations implement recommendations related to direct causes. The report also stated that for all other recommendations, PMCD and the PMCD field office at TOCDF should conduct oversight of the service contractors, implementation and provide confirmation to the ASA(I&E) .

Valve failure allowed agent migration beyond the expected agent boundary. In the report, the Board identified failed components as an indirect cause of the accident, and the failure of EG&G engineers to verify agent migration as an observation. We believed that agent located outside the expected boundary was at least a direct cause of the incident, and that to prevent reoccurrence the Army needs to fix the agent migration problem. While the

Board report did not sufficiently stress the impact of valve failure, implementation of report recommendations should address the problem.

TOCDF Safety Concern Reporting Process

TOCDF did not have a healthy safety culture, defined as a set of attitudes and attributes reflected in workers, supervisors, and managers that safety is the fundamental priority and prerequisite for doing work. The Army investigation report concluded that the common theme of their findings and observations was an ineffective safety culture. The report further stated that a healthy safety culture should encourage the reporting of near misses and potential problems without the fear of reprisal to improve procedures and deter the recurrence of problems. We assessed the EG&G safety culture and process for reporting safety concerns by interviewing the contractor employees, attending a meeting of the safety committee, and conducting an anonymous safety opinion survey of 212 employees with TOCDF plant access from the day and evening shifts. See Appendix B for a copy of the survey. The following table provides overall survey results.

Tooele Chemical Agent Disposal Facility Survey Results¹				
Question	Yes		No	
Are you aware of the hazard- reporting processes in place at TOCDF?	198	93%	14	7%
Do you feel that others will dismiss your concerns if you report a safety issue or hazard?	40	19	166	78
Have you ever raised a safety/hazard concern using the formal reporting system?	93	44	118	56
If you have reported a concern, did management adequately respond to your issue?	82	39	37	17²
Would you be more willing to voice concerns if you could report them outside the company?	51	24	150	71
To the best of your knowledge, does management follow published hazard-reporting procedures?	163	77	31	15
Does management encourage employees to report health or safety-related issues to supervisors?	187	88	19	9
Do you feel comfortable raising safety/hazard concerns to your supervisor?	174	82	37	17
Have you ever been told to just fix a problem and not report it?	33	16	174	82
Do you know of anyone that reported a safety concern at the TOCDF and later [their] employment was terminated?	26	12	178	84
Do you think TOCDF places production above safety?	110	52	89	42
Do you know of any worker who was exposed to chemical agent but did not report the incident?	8	4	199	94
¹ The percentages in the table may not sum to 100 percent because several respondents chose "Not Applicable" or declined to answer the question.				
² The percentages for this question are reduced because a response was dependent on a "Yes" response to the prior question.				

Informal Reporting Process. EG&G did not have a documented process for reporting safety concerns. On-site management stated that safety was the responsibility of every employee, and advised employees to address concerns either through their direct chain of command or committees such as the Employee Safety Committee. The survey results indicated that approximately one-quarter of the survey respondents believed that their management either dismissed or did not adequately respond to their concerns. We conclude that due to a lack of a documented process, neither the contractor nor the Army could verify or disprove this belief.

Employee and Management Communications. Through interviews with EG&G employees, we identified that communication between employees and supervisors was ineffective and employees were not comfortable raising concerns to their direct supervisor. The survey results provided contradictory views of the communication between employees and managers. A high number of respondents felt comfortable raising a safety concern to their supervisor (82 percent), were aware of the safety reporting process (93 percent), and believed management encourages safety reporting (88 percent). However, the results also indicated that approximately a quarter of the survey respondents would be more comfortable reporting concerns outside of the company, while 16 percent of the survey respondents stated they had been told to fix a problem and not report it. A more disturbing result was that eight respondents indicated knowledge of an unreported worker exposure.

Production and Safety. Our survey results indicated that 52 percent of the employees believed that management placed production above safety, and 12 percent knew of persons that reported safety concerns and were later terminated. The ASA(I&E) also perceived that EG&G stressed production over safety at TOCDF. For example, the negotiated contract for TOCDF operations included a million dollar bonus if EG&G completed destruction of GB agent prior to the opening of the 2002 Winter Olympic Games in Utah. The ASA(I&E) believed this increased the risk of a chemical agent accident and stated he had the contract changed. Further, in its internal investigation report on chemical agent exposure on July 15, 2002, the contractor's investigation team stated that facility management must focus on improving the safety culture at TOCDF.

Federal Agency Accident Investigation Process Comparison

The Army investigation and corrective action process compares favorably with our review of similar processes in the Navy, Air Force, Department of Energy, National Transportation Safety Board, and National Aeronautics and Space Administration (Appendix C). All the processes, with the exception of the National Transportation Safety Board, categorized accidents and mishaps based upon the following characteristics: the occurrence of a fatality, occurrence and severity of a disability, hospitalization of persons, lost workdays, and monetary damage or estimated property loss. Following the occurrence of an accident or mishap, all the Federal agencies reviewed have established notification procedures. Federal agencies reviewed conduct investigations through

interviews, examination of policies and procedures, and on-site analysis of systems and facilities. All investigation boards are appointed in accordance with independence standards, and tasked to identify accident causes and make recommendations to prevent reoccurrence. All boards of investigation were required to submit formal reports. While finalizing reports, all Federal agencies required the organization with responsibility for the accident to submit corrective actions and requirements necessary to prevent the accident or mishap reoccurrence. In all cases, the purpose of the investigation is to identify accident causes and make recommendations to prevent reoccurrence.

Corrective Action

Army Regulation 385-40 requires Boards of Investigation for chemical agent events to provide reports to the commander of the major command where the accident occurred. Normally, the commander forwards reports to the Office of the Chief of Staff, Director of Army Safety within 90 days of an accident. Forwarding endorsements should contain corrective actions taken to date and milestones for future corrective actions. The Army investigation report concerning the TOCDF incident, including a request for a corrective action plan, was signed on September 23, 2002.

On October 17, 2002, PMCD provided the office of the ASA(I&E) with a corrective action plan including proposed suspense dates addressing all report recommendations. The ASA(I&E) stated that the Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health would track corrective actions and conduct on-site verification. In addition, the Assistant to the Secretary of Defense (Nuclear and Chemical and Biological Defense Programs) stated that he would ensure participation of the Office of the Secretary of Defense during the on-site verification. Army officials further stated that TOCDF would not resume operation until the corrective actions related to direct causes of the accident were implemented. PMCD reported completion of corrective actions associated with the direct causes of the worker exposure during the first week in January 2003. On January 13, 2003, the Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health led a multidisciplined team to TOCDF to verify completion.

Conclusion

According to the Deputy Assistant Secretary of the Army for Chemical Demilitarization, EG&G workers at the TOCDF “lost their agent sense” for the dangers associated with GB agent during the maintenance period between agent destruction campaigns. This lessened awareness to danger, poor internal communications, and a weak safety culture led to the chemical agent accident of July 15, 2002. According to DoD policy and Army regulations, the resulting worker exposure was not classified a significant accident. However, the Army response included concurrent investigations by the systems contractor and the Army Secretariat. We believe that the decision by the ASA(I&E) to treat the

worker exposure as a serious accident, conduct an investigation led by senior Army management, and use the investigation findings to generate program improvement as the correct response.

Based on interviews with participants, personal observations, and discussions with experienced accident investigators, we concluded that the Board President assembled a fully qualified team, conducted a complete investigation of the incident, and produced a comprehensive report of Board findings. On October 3, 2002, the Deputy PMCD published a Safety Improvement Program for the chemical demilitarization program incorporating general findings in the Board of Investigation report. PMCD also developed a specific corrective action plan to address recommendations from the Board of Investigation.

The ASA(I&E) stated that the limited release of the investigation report in accordance with Army Regulation 385-40 hinders both implementing of corrective actions and sharing useful findings and recommendations across the chemical demilitarization program. In addition, as of December 2, 2002, the Army had not filled the PMCD program manager position, and planned to transfer program responsibility from the ASA(I&E) to Assistant Secretary of the Army for Acquisition, Logistics, and Technology. Provided that the Army overcomes these obstacles and accurately tracks and verifies the correction of identified deficiencies, the investigation will have met the intent and purpose of preventing accident reoccurrence.

Appendix A. Scope and Methodology

The scope of this report is limited to the specific areas requested by the Assistant to the Secretary of Defense (Nuclear and Chemical and Biological Defense Programs). We evaluated the Army's Board of Investigation procedures and subsequent report for the chemical agent event. We limited our review of other Federal agency investigation procedures and corrective action development to the published policies and procedures of the Navy, Air Force, Department of Energy, National Transportation Safety Board, and National Aeronautics and Space Administration. We did not review the management control program because it was not an announced objective.

We reviewed pertinent DoD and Army policies and regulations, dated from November 1, 1994, through October 12, 2001. We interviewed the ASA(I&E), Board members, and Government and contractor employees at PMCD and TOCDF. We visited PMCD headquarters and TOCDF. At TOCDF, we toured the facility where the accident occurred and conducted an employee opinion survey of the safety reporting process.

We performed this evaluation from August 2002 through January 2003 according to standards implemented by the Inspector General of the Department of Defense.

Use of Computer-Processed Data. We did not use computer-processed data to perform this review.

Use of Technical Assistance. Members of the Quantitative Methods Division, Office of the Inspector General of the Department of Defense assisted us in developing the survey questionnaire used at TOCDF, and analyzing, tabulating, and reporting survey results. Their work did not include projecting survey results to the larger population at TOCDF. Finally, we used senior accident investigators from the Department of Energy as consultants to perform an independent analysis of the adequacy of the Army Board report.

Prior Coverage

During the last 5 years, the General Accounting office (GAO) and the Inspector General of the Department of Defense (IG DoD) have issued two reports discussing chemical agent related issues. Unrestricted GAO reports can be accessed over the Internet at <http://www.gao.gov>. Unrestricted Inspector General of the Department of Defense reports can be accessed at <http://www.dodig.osd.mil/audit/reports>.

GAO

GAO Report No. GAO-02-890, "Chemical Weapons: Lessons Learned Program Generally Effective but Could Be Improved and Expanded," September 10, 2002

IG DoD

IG DoD Report No. 98-051, "Chemical Event at Tooele Chemical Agent Disposal Facility," January 20, 1998

Appendix B. Employee Opinion Survey

TOCDF Safety Opinion Survey				
	(Please circle the answer that applies)			
1	Are you aware of the hazard-reporting processes in place at TOCDF?	Y	N	N/A
2	Do you feel that others will dismiss your concerns if you report a safety issue or hazard?	Y	N	N/A
3	Have you ever raised a safety/hazard concern using the formal reporting system?	Y	N	N/A
4	If you have reported a concern, did management adequately respond to your issue?	Y	N	N/A
5	Would you be more willing to voice concerns if you could report them outside the company?	Y	N	N/A
6	To the best of your knowledge, does management follow published hazard-reporting procedures?	Y	N	N/A
7	Does management encourage employees to report health or safety-related issues to supervisors?	Y	N	N/A
8	Do you feel comfortable raising safety/hazard concerns to your supervisor?	Y	N	N/A
9	Have you ever been told to just fix a problem and not report it?	Y	N	N/A
10	Do you know of anyone that reported a safety concern at the TOCDF and later [their] employment was terminated?	Y	N	N/A
11	Do you think TOCDF places production above safety?	Y	N	N/A
12	Do you know of any worker who was exposed to chemical agent but did not report the incident?	Y	N	N/A

Background of this Questionnaire

WHAT IS THIS?
The questionnaire asks about your experiences, opinions, and perceptions. This questionnaire is being administered as one part of an Inspector General of the Department of Defense assessment of the facility's process for employee reporting of safety concerns.

WILL MY RESPONSES BE KEPT PRIVATE?
YES. Your responses will be combined with those from other people and will be used to report the experiences, opinions, and perceptions of workers at the TOCDF. Please do not provide any personal names or information anywhere on this questionnaire.

WHY ME?
All employees are directly affected by safety issues at the TOCDF. Based on your responses and the responses of others, conclusions may be drawn about the safety reporting process at TOCDF. The validity of these conclusions depends on active participation from individuals like yourself.

WHY SHOULD I BOTHER?
Questionnaire findings may result in changes that affect you and other TOCDF personnel. Please complete and turn in your survey at the end of your shift.

WHAT IF I REALLY WANT TO TALK?
 You may call in additional comments to the Inspector General.
 Call: Mr. George Marquardt at 703-604-9275 or
 Mr. Wei Wu at 703-604-9316.

Appendix C. Federal Agency Accident Investigation Processes

The accident investigation process for the Army, Navy, Air Force, Department of Energy, National Transportation Safety Board, and the National Aeronautics and Space Administration contains identical elements: notification, classification, investigation, reporting, and recommendations leading to corrective actions. In all cases, the primary purpose of the safety investigation is to identify accident causes and make recommendations to prevent reoccurrence of a similar event.

Notification. In all cases, policy required organizations to report serious accidents. Agency policies required notification to responsible individuals within the organization, and contained guidelines for information release to the Occupational Safety and Health Administration and the media.

Classification. All of the accident investigation processes reviewed, with the exception of the National Transportation Safety Board, required accident severity classification based on the occurrence of a fatality, the occurrence and severity of disabilities received, hospitalization, lost workdays, and monetary damage or estimated property loss. For the Army, Navy, Air Force, and National Aeronautics and Space Administration, the most serious accident involves a fatality, permanent total disability, or the damage or loss of property greater than or equal to \$1 million. Department of Energy policy limited fatalities to those occurring within 30 days of the accident, and established a \$2.5 million threshold. The National Transportation Safety Board classified accidents based upon the safety issues that arise from the event.

Investigation. All the organizations required the formal appointment of experienced, trained members to investigation boards. The required composition of boards varied greatly among organizations, but all established independence requirements for board members. While investigation methodologies differed, all boards were given the goal of future accident prevention through identification of accident causation and development of material, process, and procedure improvements. In addition, the National Aeronautics and Space Administration's guidance contained alternative procedures for criminal or legal investigations.

Reporting. The accident investigation processes reviewed all required investigation boards to submit formal reports. The suggested time from the accident to report completion varied greatly, from 60 days for the National Aeronautics and Space Administration, to no explicit time limit for the National Transportation Safety Board.

Corrective Action. Accident investigation policy required Boards of Investigation to make recommendations for corrective actions to prevent accident or mishap reoccurrence. Organizations were required to either submit the corrective action plan with the approved report or shortly thereafter. However, monitoring and verification procedures varied among the agencies reviewed.

Appendix D. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition, Technology, and Logistics
Assistant to the Secretary of Defense (Nuclear and Chemical and Biological [NCB]
Defense Programs)
Under Secretary of Defense (Comptroller)/Chief Financial Officer
Deputy Chief Financial Officer
Deputy Comptroller (Program/Budget)

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Assistant Secretary of the Army (Installations and Environment)
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Department of the Navy

Naval Inspector General
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Department of the Air Force

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House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
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House Committee on Government Reform

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member (cont'd)

House Subcommittee on Government Efficiency, Financial Management, and Intergovernmental Relations, Committee on Government Reform

House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform

House Subcommittee on Technology and Procurement Policy, Committee on Government Reform

Assistant to the Secretary of Defense (Nuclear and Chemical and Biological Defense Programs) Comments



ASSISTANT TO THE SECRETARY OF DEFENSE
3050 DEFENSE PENTAGON
WASHINGTON, DC 20301-3050

12 FEB 2003

MEMORANDUM FOR DEPARTMENT OF DEFENSE INSPECTOR GENERAL

FROM: SPECIAL ASSISTANT FOR CHEMICAL STOCKPILE MATTERS
(Prepared by Ms. Barbara Burgess, OATSD(NCB), 588-1983 x113,
February 3, 2003)

SUBJECT: Draft DoD-IG Report #D2002CB-0200, *Army Response to Chemical Agent Incident at Tooele Chemical Agent Disposal Facility*

We reviewed the subject document, and recommend the following changes:

- Page 1, DoD Chemical Demilitarization Program, sentence 6, Change to read "During July 2002, of the eight programmed chemical agent disposal program facilities, TOCDF was the only site operating."
Rationale: Accuracy. There are currently eight programmed chemical agent destruction sites.
- Page 11, Conclusion. Recommend deletion of the last sentence.
Rationale: The lack of a Program Manager has not been determined to be a reflection on the Army investigation requirements.

In general, the report was very thorough and captured the problems occurring during the investigation, as a result of Army procedures and regulations not directly applicable to a chemical agent exposure incident.

If you have any questions, my point of contact for this action is Ms. Barbara Burgess, at (703) 588-1983.

Patrick J. Wakefield
Special Assistant for Chemical Stockpile Matters

Final Report
Reference

Corrected

Revised

Team Members

The Contract Management Directorate, Office of the Assistant Inspector General for Auditing of the Department of Defense prepared this report. Personnel of the Office of the Inspector General of the Department of Defense who contributed to the report are listed below.

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